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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,696	06/13/2002	Dimitri Donskoy	7604/21/1	3736

7590

07/25/2003

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EXAMINER

SAINT SURIN, JACQUES M

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 07/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/069,696

Applicant(s)

DONSKOY ET AL.

Examiner

Jacques M Saint-Surin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08/14/02, 09/05/02 and 06/13/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 143 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 7, 9-10, 11-12, 17, 19-23, 27, 29-34 and 38, 41-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Rudd (US Patent 4,554,836).

Regarding claim 1, Rudd ('836) discloses an electromagnetic wave vibrometer apparatus (laser vibrometer 10, see: Fig. 1 and col. 2, line 24) comprising:

a signal generator (signal generator 22, see: Fig. 1 and col. 2, line 36) for generating an electromagnetic signal;

a transmitter (transducer 20, see: Fig. 1 and col. 2, lines 36-37) for transmitting the signal at a vibrating object (object surface 28, see: Fig. 1 and col. 3, line 59);

a receiver (photodetector 32, see: Fig. 1 and col. 3, line 40) for receiving a reflected and/or scattered phase modulated signal from the vibrating object (28);

a demodulator (phase demodulator 42, see: col. 4, line 5) for demodulating the received signal; and

a signal processor (visual display and recording device such as oscilloscope or minicomputer, see: col. 4, lines 18-23) for analyzing the vibration waveform of the demodulated signal.

Regarding claim 11, it is an apparatus claim that recites the same limitations of the device claim 1. Therefore, it is rejected for the reasons set forth for that claim.

Regarding 21, it is a method claim that recites the steps for performing the functions of claim 1. Therefore, it is rejected for the reasons set forth for that claim.

Regarding claim 32, it is a method claim that recites the steps for performing the functions of claim 1. As discussed above, it is rejected for the reasons set forth for that claim. Furthermore, Rudd discloses a phase demodulator 42 tuned to the acoustic modulation frequency, e.g. 40 MHz and connected to photodetector 32 will produce an analog signal E' which is indicative of the actual displacement of vibrating surface 28, see: col. 4, lines 5-9.

Regarding claims 2, 12, 22 and 33, Rudd discloses a laser beam for use as an optical, ultrasonic transducer, see: col. 1, lines 51-52; Rudd further discloses an acoustic-optic modulator or Bragg cell 16 is disposed in the path of beam A (col. 2, lines 30-31) and the amplitude of the surface vibration is determined by measuring the phase modulation of the shifted beam relative to the reference or unshifted beam (see; col. 1, lines 67-68 and col. 2, lines 1-2).

Regarding claims 23 and 34, Rudd discloses the scattered light has been shifted in frequency from the reference beam by an acoustic-optic modulator (col. 1, lines 64-66) . Furthermore, Rudd discloses the amplitude of the surface vibration is determined by measuring the phase modulation of the shifted beam, see: col. 1, lines 67-68 and col. 2, line 1.

Regarding claims 7, 17, 27 and 38, Rudd discloses a laser signal source 12, see: Fig. 1.

Regarding claims 9, 19, 30 and 42, Rudd discloses a second vibration receiver (photodiode 36, see: Fig. 1) mounted with the first receiver 32 for compensation for unwanted background or coupled vibration.

Regarding claims 10, 20, 31 and 43, Rudd discloses a focusing lens 26 that may be a microscope objective lens and is adjustable along the optical axis means of beam B, see: col. 3, lines 6-10.

Regarding claims 29 and 41, Rudd discloses due to this arrangement, it is straight light, as indicated by the arrows S in Fig. 1, from beam A which actually impinges on the photosensitive region 38 along with beam D, this offset arrangement tends to equalize the intensities of the incident beams and prevents saturation of the photodiode 36, see: col. 3, lines 53-57.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 3-6, 13-16, 24-26 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudd (US Patent 4,554,836) in view of Kljuev et al. (US Patent 4,481,825).

Claims 3-4, 13-14, 24 and 35 differ from Rudd by reciting a microwave frequency signal. Kljuev ('825) discloses a microwave generator transmitting microwave energy through an antenna a microwave generator transmitting microwave energy through an antenna system to an object to be the antenna system includes an elliptical mirror having a second focal point in the immediate vicinity of the object being investigated, while the radiator is located in the first focal point close to the mirror, said radiator irradiating the whole surface of said mirror (see: col. 2, lines 11-13 and col. 2, lines 11-23). It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Rudd the microwave of Kljuev as taught above because it would include an optical guidance used for aiming the mirror of the antenna at the object being investigated thereby the combination would be able to provide a device for measurement of vibrations which ensures good resolution and sensitivity when a large-size object to be measured is located at a considerable distance from the device in a reliable manner.

Claims 5-6, 15-16 and 25-26 and 36-37 differ from Rudd by reciting a combination of optical and microwave signals. Kljuev et al. ('825) discloses the optical system 20 comprises an objective 22 located on the axis 21 of the mirror 7 in from of the reflector 10 of the radiator 8 as viewed from the investigated object 5, a light guide 23 for transmission of the image of the object 5 (see: col. 4, lines 11-15). Kljuev et al. ('825) further discloses the microwave energy of the generator is transmitted through the waveguide system 3 to the radiator 8 irradiating the entire surface of the mirror 7 of the antenna system (see: col. 4, lines 59-62). It would have been obvious to one having ordinary skill in the art at the time of the invention to be motivated to recognize the advantages of utilizing in Rudd et al. the techniques of Kljuev et al. as taught above because the optical guidance of the device provides high accuracy of aiming the device at any section of the object under study thereby, making the above combination more effective and reliable.

5. Claims 8, 18, 28 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudd (US Patent 4,554,836) in view of Flock et al. (US Patent 5,897,494).

Regarding these claims, although Rudd discloses a laser source, it does not specifically disclose or suggest a LED signal source. Flock et al. ('494) discloses a diode laser source 10, see: Fig. 1. Note that in lightwave transmission systems, light emitting diodes or lasers are used as sources of light and these devices are fabricated from multilayered structures of compounds semiconductors epitaxially grown on a single-crystal substrate. It would have been obvious to one having ordinary skill in the

art at the time of the invention to utilize in Rudd the light emitting diode of Flock et al. as taught above because the LED are used as sources for optical data link applications in which the data rates are less than about 500 megabits per second and the transmission distances do not exceed a few kilometers and moreover, they use less power than normal incandescent light bulbs thereby, making the above combination more efficient.

6. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rudd (US Patent 4,554,836) in view of Wang et al. (US Patent 5,495,767).

This claim differs from Rudd by reciting wherein the generated signal is split into first and second signals and the second signal is transmitted to a demodulator for comparing the second signal with the received reflected signal. Wang et al. discloses a beam splitter 14, see: Fig. 1 and col. 2, line 3. It would have been obvious to one having ordinary skill in the art at the time of the invention to include in Rudd the beam splitter of Wang et al. as taught above because the beam splitter is known for reflecting a first portion of a beam and is also common knowledge in the art and are readily commercially available.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Springer, III et al. (US Patent 6,505,130) discloses a laser doppler vibrometer for remote assessment of structural components.



Zang et al. (US Patent 5,838,439) discloses heterodyned self-mixing laser diode vibrometer.

Wortge et al. (US Patent 6,209,396) discloses a method and apparatus for two-dimensional vibrational analysis.

Zook et al. (US Patent 6,246,638) discloses a fiber-optic vibration sensor based on frequency modulation of light-excited oscillators.

Zang et al. (US Patent 5,838,439) discloses heterodyned self-mixing laser diode vibrometer.

Springer, III et al. (US Patent Application 2003/0074145) discloses a laser doppler vibrometer for remote assessment of structural components.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M Saint-Surin whose telephone number is (703) 308-3698. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

  
Jacques M. Saint-Surin  
July 10, 2003

HELEN KWOK  
PRIMARY EXAMINER

